

PRELIMINARY DATA SUMMARY

June 1985

U.S. Army Engineer Waterways Experiment Station
Coastal Engineering Research Center
Field Research Facility
Duck, North Carolina

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CERC Field Research Facility
Duck, North Carolina

This report provides a summary of basic oceanographic, meteorological and bottom profile data for the month. The data were obtained as part of the Field Research Facility Measurement and Analysis Work Unit at the U.S. Army Engineer Waterways Experiment Station, Coastal Engineering Research Center's Field Research Facility in Duck, North Carolina. The data were collected and the analyses performed by the FRF staff. These summaries are intended to make the data readily available to all FRF users, and comments on their content and usefulness are invited.

CONTENTS

	Page
COVER	
TITLE PAGE	
TABLE OF CONTENTS	1
I INTRODUCTION	2
II METEOROLOGICAL DATA	6
III WAVE DATA	9
IV CURRENT DATA	14
V SUPPLEMENTAL OBSERVATIONS	20
VI WATER LEVELS	22
VII NEARSHORE PROFILES AND BATHYMETRY	26
VIII SPECIAL EVENTS	29

FIGURES

1 LOCATION MAP	3
2 INSTRUMENT LOCATIONS	5
3 TIME HISTORY OF WAVE HEIGHTS AND PERIODS	12
4 TIDE RANGE TIME HISTORY	23
5 WATER LEVEL TIME HISTORY	24
6 CRAB PROFILES	26
7 CRAB PROFILE ENVELOPE	27
8 FRF CONTOUR DIAGRAM	28

TABLES

1 INSTRUMENT STATUS/DATA AVAILABILITY	4
2 METEOROLOGICAL DATA	7
3 WAVE DATA	10
4 CURRENT DATA	15
5 SUPPLEMENTAL OBSERVATIONS	21
6 TIDAL CHARACTERISTICS	25

I. INTRODUCTION

The U.S. Army Engineer Waterways Experiment Station, Coastal Engineering Research Center's (CERC) Field Research Facility (FRF) is located on the Outer Banks of North Carolina, near the village of Duck (Fig.1).

The FRF research program provides a means for obtaining high-quality field data, particularly during storms, in support of the U.S. Army Corps of Engineers' coastal engineering research missions. The FRF consists of a 561-m (1,840 ft) long concrete research pier supported on 0.91 m (3 ft) diameter steel piles. The pier deck is 6.1 m (20 ft) wide, 7.74 m (25.4 ft) above mean sea level (MSL), and extends from behind the dunes to approximately the 7.6 m (25 ft) depth contour. In addition, a main building contains offices, an instrument repair shop, and a data acquisition room.

One of the responsibilities of the FRF research program is the collection, analysis and dissemination of data on local oceanographic and meteorological conditions. Bottom profiles along both sides of the pier and periodic bathymetric surveys are also performed.

This summary is intended to provide basic data as soon as possible after they are obtained. Most of the data are daily observations or the results of preliminary data analysis. In many instances, continuous analog records and more extensive analyses will be made available later by the CERC Coastal Engineering Information and Analysis Center (CEIAC).

Table I is a list of instruments used, their status during the month, and the data collection status. Figure 2 identifies the location of the instruments. The water depth at the wave gages and current meters vary and may best be determined from the information contained in Figure 8. Other installation information is contained in Table I. All times unless otherwise specified are referenced to Eastern Standard Time (EST).

Section II presents the meteorological data; Sections III through VI, oceanographic data; Section VII, nearshore profiles and bathymetry; and Section VIII, if included, documents special events that occurred at the FRF during the month.

Questions and/or comments concerning the data may be directed to Mr. H. Carl Miller at (919) 261-3511.

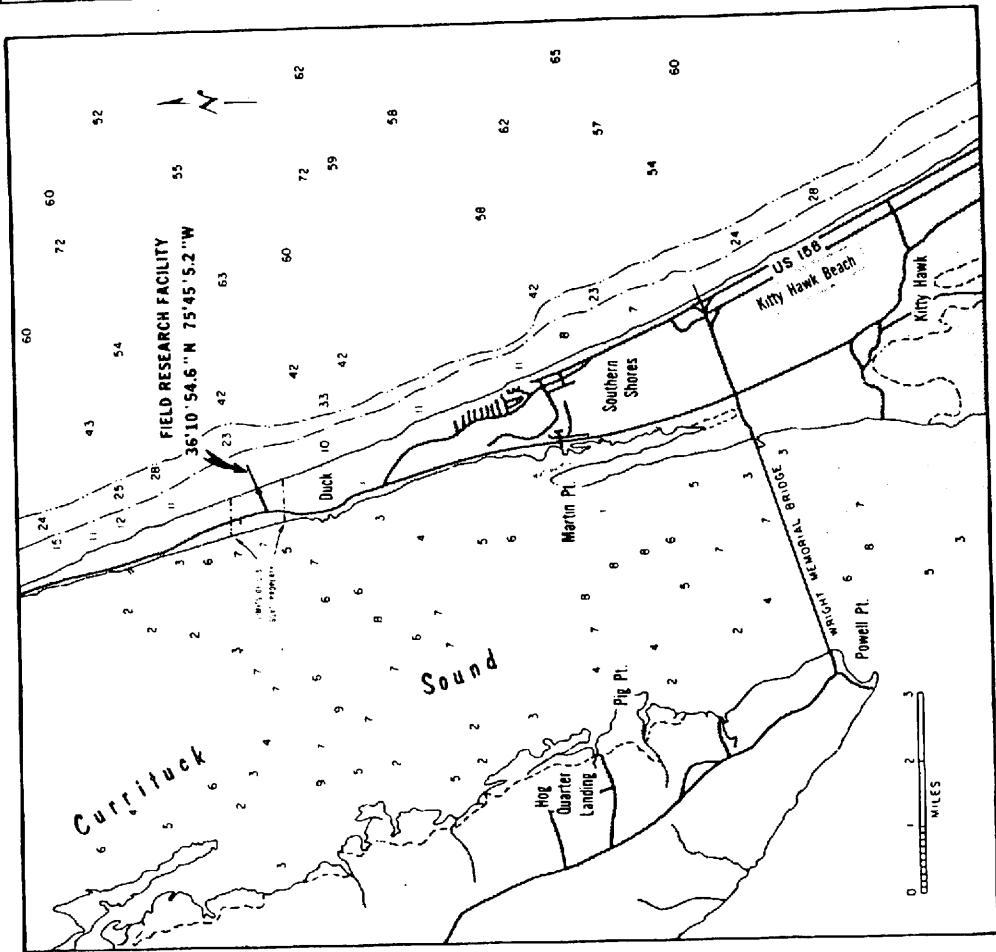
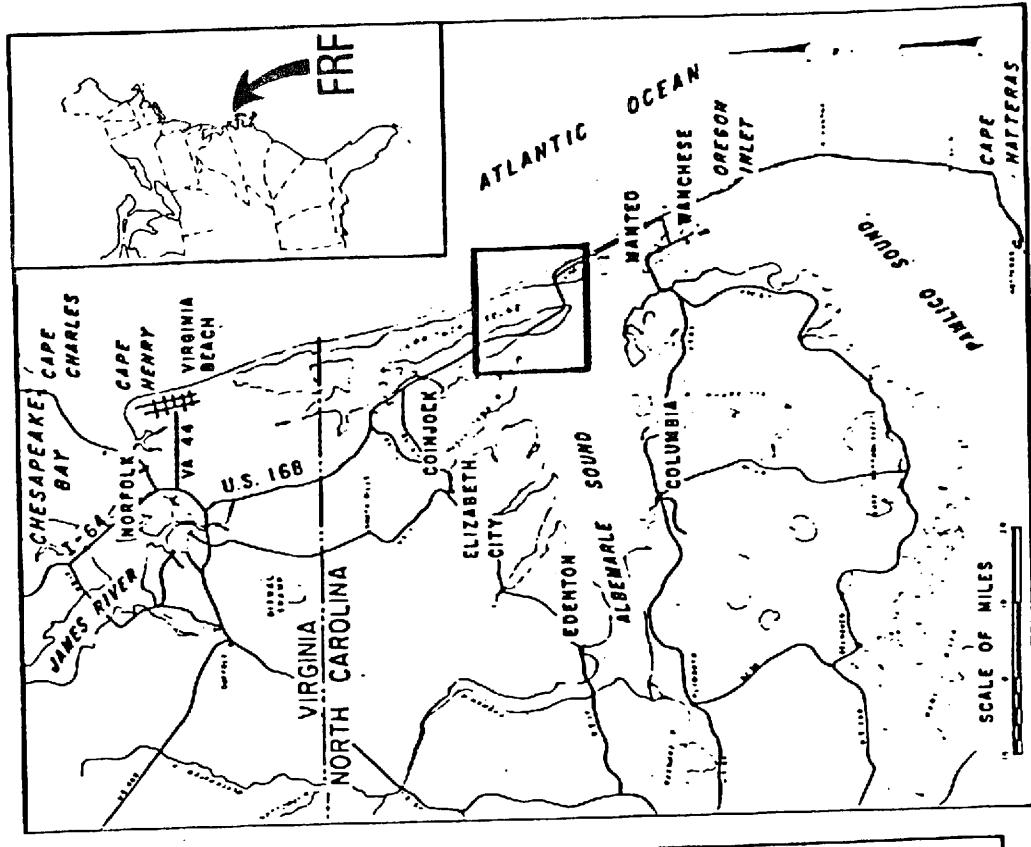


Figure 1. FRF Location Map

TABLE I
INSTRUMENT STATUS/DATA AVAILABILITY

June 1985

DAY OF THE MONTH
1/2/3/4/5/6/7/8/9/10/11/12/13/14/15/16/17/18/19/20/21/22/23/24/25/26/27/28/29/30/

GAGE NUMBER	DESCRIPTION/REMARKS	DEPTH AT SENSOR	Instrument Status
	Aerometric Pressure		Data Collected Analog Record
	Precipitation		Instrument Status Data Collected
	Air Temperature		Analog Record
	Anemometer On Lab Bldg - Elevation 13m (HSL)		Instrument Status Data Collected
643	Baylor staff located at station 7400 on FRF pier	See profile	Instrument Status Data Collected
625	Baylor staff located at station 19400 on FRF pier	See profile	Instrument Status Data Collected
640	Waverider buoy located 1.0 km from shore	APPROX. 8.3 m. dust	Instrument Status Data Collected
630	Waverider buoy located 6.0km from shore	APPROX. 18 m. HSL	Instrument Status Data Collected
639	Current meter at station 1420 on FRF Pier	See profile	Instrument Status Data Collected
679	Current meter 500m south (0.5 km offshore)	APPROX. 6 m. HSL	Instrument Status Data Collected
865-1370	NOAA primary tide station located at seaward end of FRF Pier	Instrument Status Data Collected	

Instrument Status: Operational - Daily Observation: YES , PARTIAL
 Analog Record: ALL , PARTIAL
 Data Collected: ALL , SOME , NONE
 Preliminary Analysis: ALL , SOME

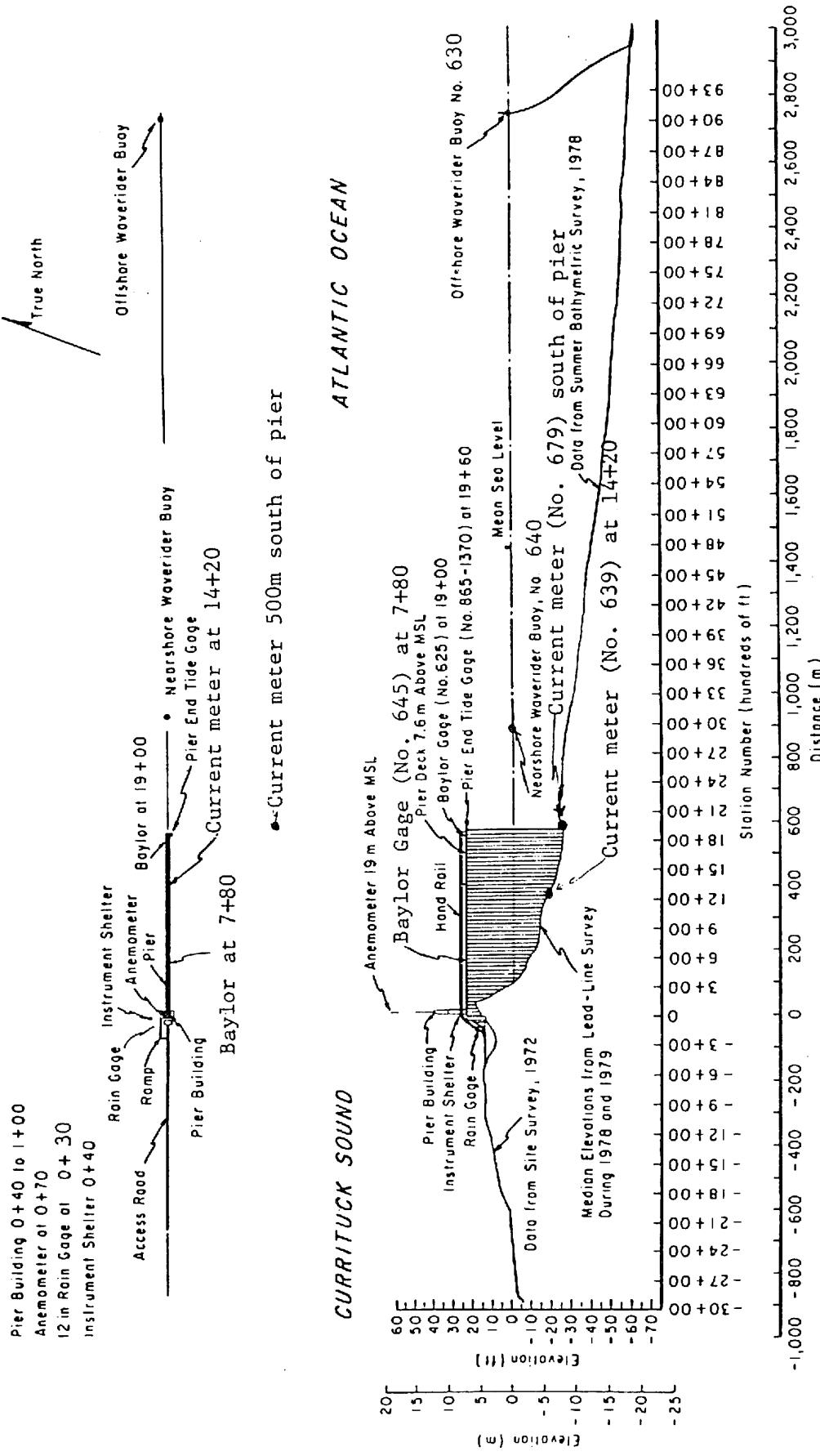


Figure 2. Instrument locations at FRF.

II. METEOROLOGICAL DATA

A variety of instruments have been installed at the FRF (Fig. 2) to monitor the meteorological conditions. The data presented in Table 2 are collected and stored on magnetic tape using a Data General NOVA-4 computer. For each instrument identified in Table 1 as having analog outputs, chart records are obtained, a log is maintained and the records are stored for future reference.

The wind measurements are obtained from a Weather Measure Skyvane located on the FRF laboratory building (Fig. 2), 19.1 m above mean sea level (MSL).

The high and low temperatures are obtained from daily readings of NWS maximum and minimum thermometers and represent the extreme temperature values since the last reading.

The following may be useful for converting the data in Table 2 to other frequently used units of measurement:

1. Millimeters (mm) to inches (in) -
 $mm \times .03937 = in$

2. Millibars (mb) to inches of mercury (in Hg) -
 $mb \times 0.02953 = in Hg$

3. Degrees Celcius ($^{\circ}C$) to degrees Fahrenheit ($^{\circ}F$) -
 $(^{\circ}C \times 9/5) + 32 = ^{\circ}F$

4. Meters per second (m/s) to knots (kn) -
 $m/s \times 1.943 = kn$

TABLE 2: METEOROLOGICAL DATA

PART 1

JUNE 1985

DAY		WIND SPEED	WIND DIRECTION (DEG TN)	TEMPERATURE (DEG C)	ATM PRESSURE (MB)	PRECIPITATION (MM)
1	100	8	203	23.0	1008.0	0
	700	6	214	24.0	1007.2	0
	1300	2	228	30.6	1007.5	0
	1900	5	122	21.8	1008.8	0
2	100	4	109	20.9	1011.1	0
	700	4	26	21.0	1012.7	0
	1300	4	93	24.5	1012.8	0
	1900	4	150	22.5	1011.1	0
3	100	6	73	20.1	1011.4	0
	700	3	357	21.5	1012.8	0
	1300	3	50	24.2	1013.4	0
	1900				1013.1	0
4	100				1014.1	0
	700	2	116	22.9	1015.5	0
	1300	5	125	27.3	1016.5	0
	1900	6	136	23.2	1015.5	0
5	100	4	197	23.3	1015.7	0
	700	3	98	21.4	1017.1	0
	1300	7	170	26.2	1015.1	0
	1900	6	191	25.1	1012.5	0
6	100	6	201	21.3	1012.8	23
	700	5	261	21.7	1013.2	0
	1300	9	23	18.4	1015.6	0
	1900	2	46	18.4	1016.0	0
7	100	2	59	18.0	1017.4	0
	700	3	11	18.8	1018.4	0
	1300	3	66	20.2	1017.7	0
	1900	3	95	19.8	1015.4	0
8	100	6	174	22.4	1013.2	0
	700	6	214	23.0	1010.5	0
	1300	7	242	28.0	1008.5	0
	1900	6	35	20.9	1009.4	0
9	100	3	167	18.4	1011.0	0
	700	3	137	21.6	1011.5	0
	1300	5	219	28.4	1010.3	0
	1900	4	182	28.0	1010.0	0
10	100	6	231	25.3	1011.2	0
	700	8	239	25.7	1012.0	0
	1300	4	31	26.7	1013.3	0
	1900	4	145	24.5	1012.6	0
11	100	3	255	26.3	1012.9	0
	700	0		25.5	1013.4	0
	1300	5	203	31.1	1011.7	0
	1900	3	136	23.1	1009.3	0
12	100	8	219	26.5	1008.0	0
	700	10	234	25.1	1006.9	0
	1300	7	227	29.9	999.9	0
	1900	4	277	21.2	1004.8	0
13	100	8	272	21.3	1005.0	0
	700	10	287	17.6	1009.1	0
	1300	6	261	21.8	1011.1	0
	1900	5	294	20.2	1013.5	0
14	100	5	337	16.5	1016.5	0
	700	3	352	19.0	1018.7	0
	1300	5	110	21.9	1018.5	0
	1900	4	143	20.9	1018.0	0
15	100	4	227	20.9	1018.8	0
	700	3	220	22.6	1019.6	0
	1300	8	128	25.9	1019.7	0
	1900	6	163	23.9	1017.7	0
16	100	2	166	22.0	1015.0	0
	700	11	237	22.6	1014.3	0
	1300	7	231	21.6	1012.3	8
	1900	7	231	23.3	1010.2	0

TABLE 2: METEOROLOGICAL DATA

PART 2

JUNE 1985

DAY		WIND SPEED HOUR	WIND DIRECTION (DEG TN)	TEMPERATURE (DEG C)	ATM PRESSURE (MB)	PRECIPITATION (MM)
17	100	6	252	21.9	1010.8	0
	700	5	257	23.2	1013.4	0
	1300	4	252	28.9	1013.7	0
	1900	2	180	26.0	1012.5	0
18	100	4	203	24.6	1011.0	0
	700	8	224	26.0	1009.7	0
	1300	4	196	32.1	1006.5	0
	1900	5	222	24.0	1007.5	17
19	100	3	302	23.1	1008.1	3
	700	3	201	21.8	1009.4	0
	1300	4	215	24.7	1009.8	0
	1900	5	196	23.7	1009.6	0
20	100	7	246	22.6	1010.6	0
	700	4	288	22.1	1012.3	0
	1300	4	236	25.5	1014.0	0
	1900	0		23.2	1014.4	0
21	100	3	223	22.7	1016.5	0
	700	3	359	21.4	1018.3	0
	1300	5	61	24.8	1020.3	0
	1900	4	88	22.2	1019.7	0
22	100	3	128	21.6	1020.9	0
	700	2	94	23.7	1022.9	0
	1300	4	110	26.3	1022.3	0
	1900	5	130	23.6	1020.9	0
23	100	3	156	21.6	1021.0	0
	700	3	208	24.4	1021.6	0
	1300	5	131	27.9	1021.4	0
	1900	4	161	24.8	1019.9	0
24	100	5	200	23.6	1019.9	0
	700	4	223	24.7	1019.7	0
	1300	4	174	30.3	1018.3	0
	1900	5	188	26.8	1015.9	0
25	100	7	233	25.2	1014.9	0
	700	8	6	19.8	1016.0	0
	1300	6	28	21.9	1017.4	0
	1900	3	94	21.1	1014.9	0
26	100	4	189	22.6	1013.2	0
	700	6	343	20.0	1011.5	11
	1300	6	0	22.2	1012.1	0
	1900	8	38	18.5	1013.0	0
27	100	6	347	18.1	1014.4	0
	700	7	352	19.2	1014.5	0
	1300	7	33	20.7	1015.3	0
	1900	4	70	19.3	1014.6	0
28	100	2	41	19.0	1015.5	0
	700	5	9	19.0	1015.5	0
	1300	4	59	21.5	1015.5	0
	1900	5	358	20.0	1014.6	0
29	100	4	213	21.6	1015.0	0
	700	5	223	23.6	1015.6	0
	1300	4	101	26.6	1015.7	0
	1900	4	150	22.8	1015.1	0
30	100	1	91	21.4	1015.5	0
	700	8	59	22.7	1015.2	0
	1300	8	60	22.5	1016.2	0
	1900	9	88	21.3	1016.9	0

III. WAVE DATA

Wave data were collected from two Baylor staff gages (CERC gage Nos. 625 and 645) and Waverider buoys (CERC gage Nos. 630 and 640, Table 1 and Figure 2). The data were collected, analyzed, and stored on magnetic tape using a Data General NOVA-4 computer.

The NOVA-4 is programmed to sample the wave gages every 6 hours near 0100, 0700, 1300, and 1900 EST at a sampling rate of four times per second, collecting data in 20-minute records.

Wave height (H_{mo}) is an energy-based statistic equal to four times the standard deviation of the sea surface elevations. The wave period is identified from the computation of a variance (energy) spectrum using a Fast Fourier Transform of 4096 data points (1024 sec). The period (T_p) is that associated with the maximum energy density in the spectrum. When this analysis is complete, the data are written to magnetic tape and entered into the CERC data base.

Table 3 presents the wave heights and periods for each wave record obtained during the month. The monthly means shown in Table 3 are an average of the values computed for all data records collected. The monthly standard deviations are standard deviations from the monthly mean of values for each record.

Figure 3 is a time history of the H_{mo} and T_p values for the Waverider 6 km from shore (630) and the Baylor gage at pier station 19+00 (625).

Differences in wave periods between wave gages (Table 4 and Figure 3) may be due to wave breaking or reformation, or the presence of multiple wave trains containing nearly equal energy.

TABLE 3: WAVE DATA

PART 1

JUNE 1985

GAGE		645		625		640		630	
DAY	TIME	Baylor at 7+80 Hmo(m)	T(sec)	Baylor at 19+00 Hmo(m)	T(sec)	Nearsho Wvrdr Hmo(m)	T(sec)	Forshr Wvrdr Hmo(m)	T(sec)
1	1	.49	10.89	.70	9.75	.67	12.34	.85	9.75
	7	.36	10.89	.67	10.89	.64	10.89	.78	9.75
	13	.41	7.42	.55	9.75	.55	10.89	.65	10.89
	19	.39	9.75	.44	10.89	.49	10.89	.62	10.89
2	1	.36	5.63	.46	10.89	.46	9.75	.53	9.75
	7	.34	6.87	.43	8.83	.50	8.83	.53	8.83
	13	.44	6.87	.53	9.75	.49	8.83	.52	9.75
	19	.40	9.75	.47	8.83	.48	8.06	.58	10.89
3	1	.54	2.62	.61	8.06	.59	9.75	.68	9.75
	7	.41	6.40	.52	3.79	.59	8.83	.62	10.89
	13	.32	12.34	.50	8.83	.50	8.83	.58	8.06
	19								
4	1			Operator Error					
	7	.39	4.76	.52	5.02	.56	8.83	.59	4.76
	13	.43	5.31	.54	8.06	.50	8.06	.61	9.75
	19	.42	6.87	.52	8.83	.57	8.06	.69	8.06
5	1	.36	5.31	.49	8.06	.50	9.75	.54	8.83
	7	.40	5.63	.54	8.06	.58	5.31	.69	5.31
	13	.54	5.63	.60	8.83	.58	10.89	.69	6.40
	19	.56	5.63	.57	5.02	.68	5.31	.74	5.99
6	1	.33	5.31	.43	9.75	.43	8.83	.53	8.83
	7	.28	5.31	.40	8.83	.36	7.42	.47	8.06
	13	.48	2.95	* .67	4.32	.67	4.76	.72	4.13
	19	.43	4.53	.55	5.02	.54	5.31	.62	5.63
7	1	.37	5.63	.63	5.31	.57	5.31	.68	5.63
	7	.48	5.31	.77	7.42	.70	7.42	.74	6.87
	13	.51	6.40	.77	7.42	.73	6.40	.76	6.87
	19	.50	5.02	.73	6.87	.73	6.40	.71	6.87
8	1	.44	5.02	.65	5.99	.65	6.87	.80	4.13
	7	.56	4.76	.69	6.87	.65	6.87	.71	4.76
	13	.38	5.63	.51	5.02	.58	5.02	.71	8.06
	19	.49	5.02	.65	2.55	.59	7.42	.64	5.63
9	1	.40	3.79	.49	3.51	.52	3.51	.57	5.99
	7	.31	5.63	.46	4.32	.46	8.06	.49	6.40
	13	.26	5.31	.40	8.06	.45	7.42	.54	9.75
	19	.34	4.53	.48	6.40	.46	6.40	.43	8.83
10	1	.25	6.40	.31	6.40	.34	9.75	.38	9.75
	7	.22	5.63	.27	8.03	.27	8.83	.33	9.75
	13	.19	6.40	.25	8.03	.24	9.75	.36	9.75
	19	.21	10.89	.28	9.75	.28	8.83	.36	9.75
11	1	.20	9.75	.26	9.75	.29	9.75	.35	9.75
	7		*	.30	10.89	.30	9.75	.48	9.75
	13	.27	4.13	.39	4.32	.41	4.13	.55	10.89
	19	.40	5.63	.41	10.89	.41	8.83	.71	5.99
12	1	.32	6.40	*	*	.40	10.89	.81	2.78
	7	.37	5.99	.38	7.42	.37	6.87	.64	6.40
	13	.36	6.87	.41	6.87	.42	10.89	.62	7.42
	19	.40	5.63	.41	7.42	.44	7.42	.64	7.42
13	1	.33	8.06	.42	8.06	.48	8.06	.76	4.13
	7	.35	3.95	.51	9.75	.52	4.13	.66	4.32
	13	.44	4.32	.50	4.32	.64	4.53	.68	4.32
	19	.41	5.02	.53	4.76	.52	4.53	.64	4.13
14	1	.39	3.95	.54	3.64	.48	3.26	.50	4.32
	7	.45	5.02	.59	4.32	.58	4.76	.74	5.02
	13	.28	5.02	.39	8.06	.41	7.42	.50	4.32
	19	.27	8.06	.34	8.06	.35	6.87	.43	8.06
15	1	.33	6.40	.33	9.75	.33	7.42	.45	6.87
	7	.25	7.42	.32	6.87	.34	8.83	.43	7.42
	13	.48	2.48	.49	8.03	.43	8.03	.51	8.06
	19	.47	7.42	.55	8.06	.57	6.87	.60	3.95
16	1	.64	5.02	.60	5.02	.50	5.63	.86	5.31
	7	.46	5.63	.48	5.31	.49	5.02	.73	5.02
	13	.28	5.99	.29	7.42	.29	7.42	.38	6.87
	19	.36	7.42	.36	8.06	.41	8.06	.56	8.06

*=Electronic Problems

PART 2

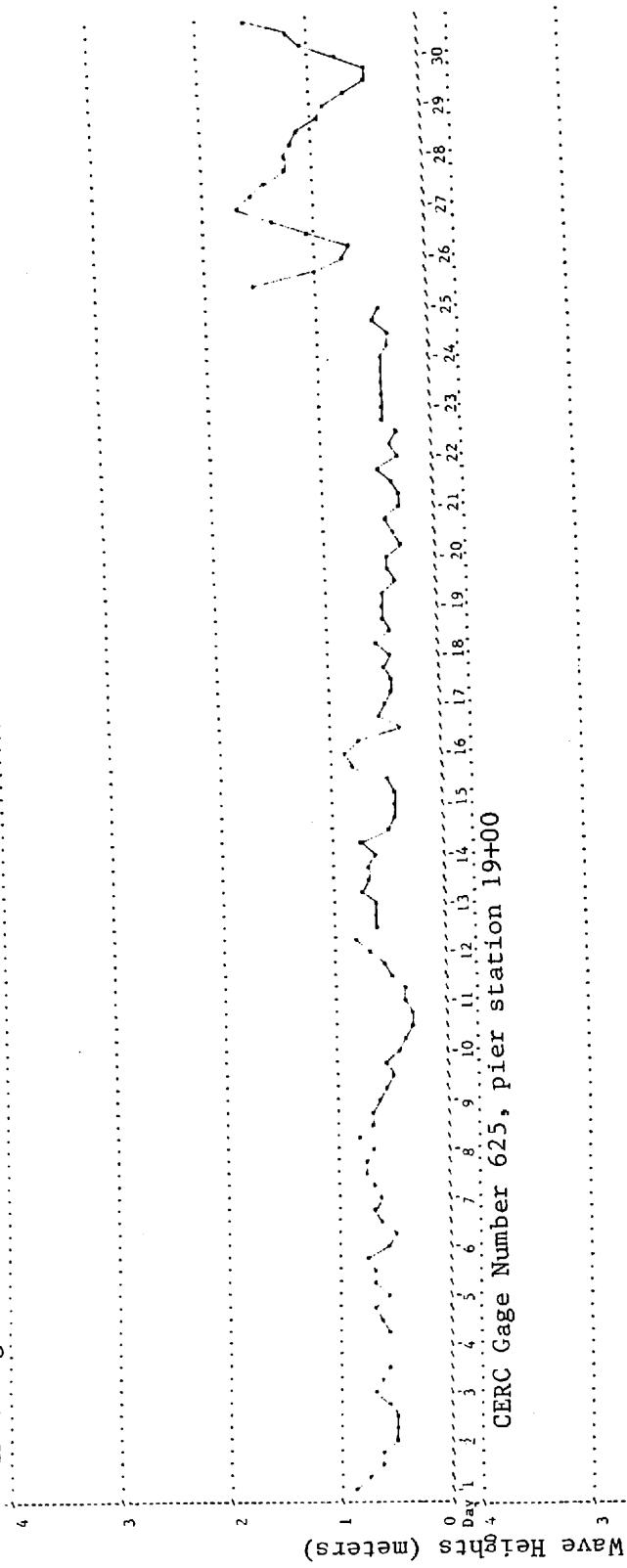
TABLE 3: WAVE DATA

JUNE 1985

GAGE	DAY	TIME	645		625		640		630	
			Baylor at 7:00 Hmo(m)	T(sec)	Baylor at 19:00 Hmo(m)	T(sec)	Nearsho Wvrdr Hmo(m)	T(sec)	Farshr Wvrdr Hmo(m)	T(sec)
	17	1	.37	6.87	.39	7.42	.41	7.42	.53	6.87
	7		.28	7.42	.30	7.42	.33	7.42	.46	7.42
	13		.37	8.06	.26	9.75	.30	7.42	.41	8.83
	19		.28	8.06	.31	8.06	.38	7.42	.48	7.42
	10	1	.37	6.87	.31	8.06	.32	8.06	.41	8.83
	7		.28	6.40	.34	6.87	.38	9.75	.46	9.75
	13		.32	5.99	.35	8.83	.34	9.75	.48	7.42
	19		.38	7.42	.38	4.53	.42	8.83	.50	6.40
	19	1	.38	6.40	.39	8.06	.38	6.87	.50	6.87
	7		.34	7.42	.33	8.83	.36	8.06	.37	8.06
	13		.30	7.42	.29	8.83	.30	8.06	.46	7.42
	19		.29	7.42	.26	7.42	.31	7.42	.45	7.42
	20	1	.28	6.40	.27	7.42	.31	7.42	.30	8.06
	7		.19	7.42	.19	7.42	.24	6.87	.39	7.42
	13				.30	8.06	.32	3.38		
	19		.28	6.87	.33	6.87	.32	6.40	.45	6.87
	21	1	.25	7.42	.28	7.42	.25	6.87	.32	6.87
	7		.20	6.87	.22	7.42	.27	8.06	.37	2.48
	13		.29	6.40	.34	9.75	.43	2.78	.50	3.05
	19		.38	3.05	.43	3.38	.32	8.03	.34	7.42
	22	1	.33	5.99	.37	3.79	.33	6.40	.37	5.63
	7		.30	6.40	.35	5.31	.30	6.40	.30	6.40
	13		.29	6.40	.32	8.83	.43	2.78	.43	5.63
	19		.36	5.31	.40	2.95	.40	3.38	.45	4.13
	23	1	.34	3.51	.39	4.76	.35	4.32	.41	4.13
	7		.33	3.79	.40	4.13	.38	4.32	.42	4.32
	13		.33	3.79	.40	4.13	.40	8.83	.46	2.95
	19		.37	2.69	.42	2.62	.38	3.64	.43	3.64
	24	1	.33	3.15	.34	3.64	.31	5.99	.36	3.26
	7		.34	5.99	.32	3.15	.30	6.87	.34	7.42
	13				*	*	.34	6.87	.47	8.83
	19		.39	6.87	.39	6.87	.28	8.06	.43	6.87
	25	1	.24	7.42	.26	8.83	.23	6.87		
	7		.28	7.42	.27	7.42	.141	6.40	1.59	6.40
	13		1.07	5.99	1.28	5.99	.87	6.87	.99	6.40
	19		.59	6.40	.86	6.87	.73	6.87	.77	6.87
	26	1	.36	5.99	.64	6.06	.57	6.40	.69	5.99
	7		.34	5.31	.63	6.40	.95	5.31	1.08	5.31
	13		.78	5.31	.94	5.31	1.10	5.02	1.35	5.31
	19		.87	5.63	1.05	4.76	1.40	6.87	1.68	6.40
	27	1	.99	6.40	1.42	6.87	1.36	9.75	1.57	8.06
	7		.95	5.31	1.36	9.75	1.25	7.42	1.44	6.87
	13		.84	6.40	1.26	6.40	1.13	7.42	1.23	7.42
	19		.65	6.40	1.13	8.06	1.11	9.75	1.23	8.06
	28	1	.87	4.76	1.02	9.75	.98	8.83	1.17	8.06
	7		.87	5.99	1.05	8.06	1.05	7.42	1.12	8.06
	13		.56	8.06	.99	7.42				
	19		.40	4.76	.74	9.75	.78	10.89	.94	8.06
	29	1	.33	9.75	.81	9.75	.83	10.89	.68	9.75
	7		.25	10.89	.52	8.83	.61	10.89	.66	9.75
	13		.23	10.89	.36	9.75	.41	9.75	.48	8.83
	19		.35	10.89	.47	10.89	.47	9.75	.52	8.83
	30	1	.50	7.42	.62	10.89	.61	9.75	.73	8.83
	7		.76	5.99	.84	8.83	.88	8.83	1.06	8.83
	13		1.09	5.99	1.11	5.99	1.11	5.02	1.20	5.31
	19		1.13	6.40	1.33	6.40	1.44	6.87	1.58	6.40
	MEAN		.41	6.29	.53	7.27	.53	7.43	.64	7.08
	STD		.19	1.89	.26	2.17	.27	2.10	.29	2.06

*=Electronic Problems

CERC Gage Number 630; Waverider 6 km from shore



12

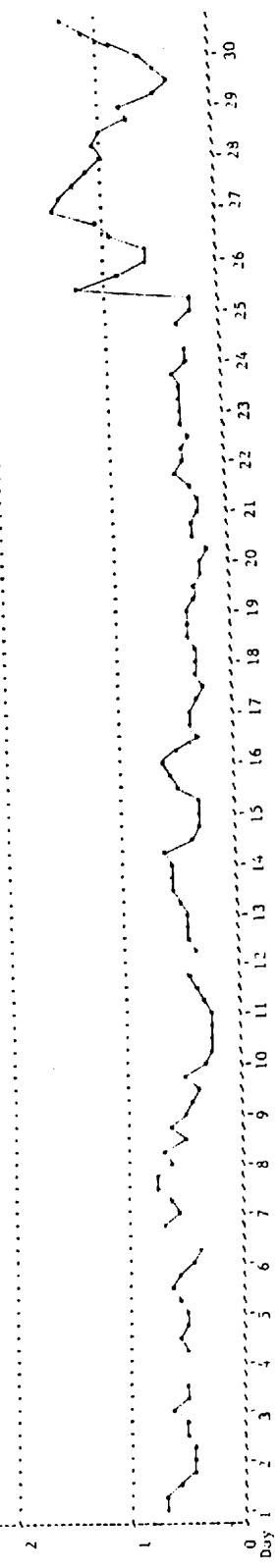
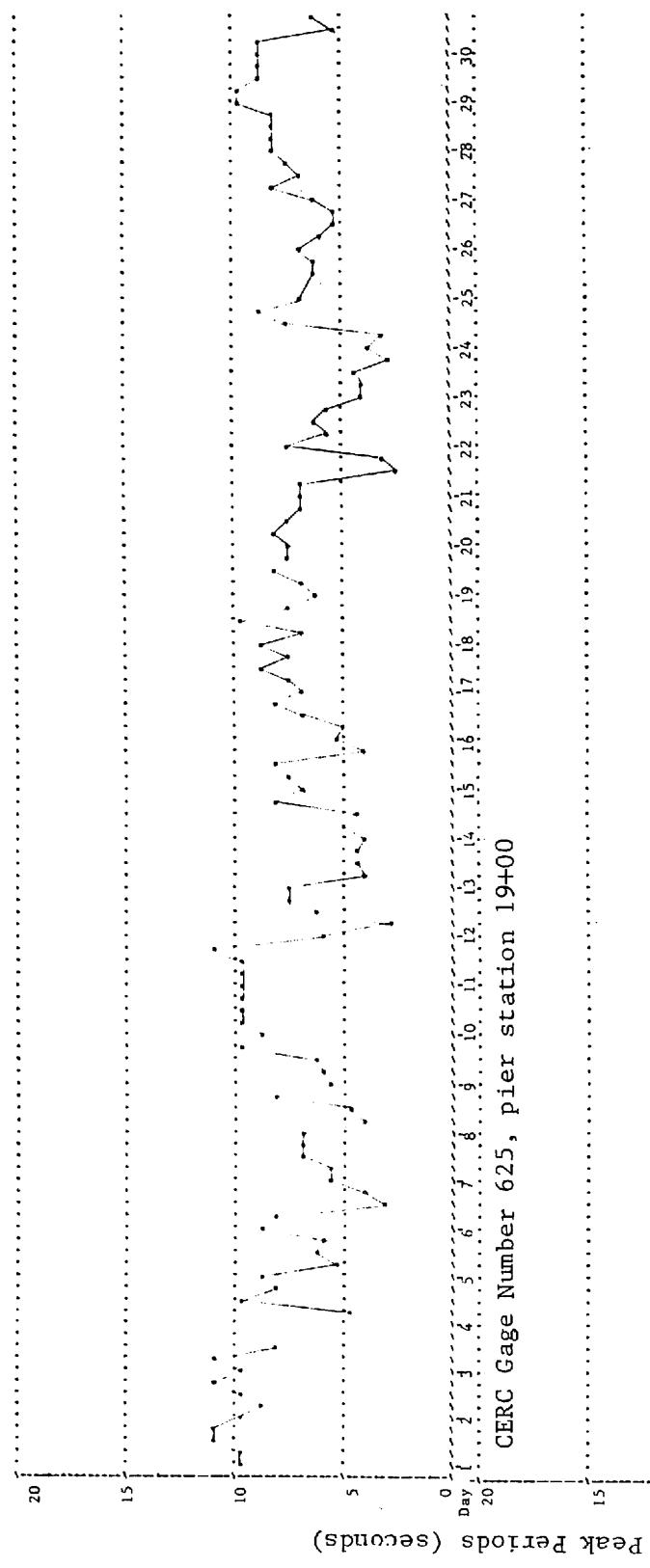


FIGURE 3. Time History of Wave Heights and Periods - June 1985 Part I:Heights

CERC Gage Number 630, Waverider 6 km from shore



13

CERC Gage Number 625, pier station 19+00

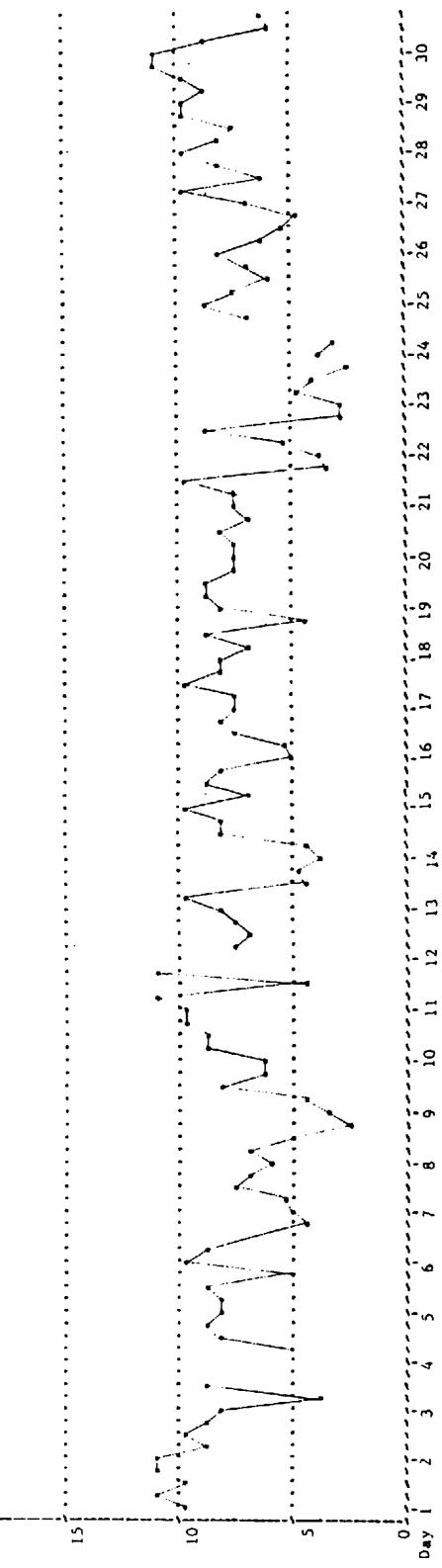


FIGURE 3. Time History of Wave Heights and Periods - June 1985

Part II: Periods

IV. CURRENT DATA

Current data (Table 4) are collected from two Marsh-McBirney electromagnetic biaxial current meters (Table 1 and Figure 2) and by visually observing the movement of dye on the water surface in the surf and at the seaward end of the pier, as well as 500 m updrift of the pier 12 m offshore.

Since the shoreline orientation is approximately N20°W, alongshore currents flow either toward 340° (i.e. northward) or toward 160° (i.e. southward). Similarly, cross-shore currents are either onshore (westward) or offshore (eastward).

All current speeds are given in centimeters per second.

TABLE 4: CURRENT DATA
(SPEEDS IN CM/SEC)
June 1985

DAY	TIME	PIER MEASUREMENTS			BEACH MEASUREMENTS: (500 UPDRIFT)			CURRENT METER AT SOUTH TRIPOD
		DYE AT	CURRENT METER	DYE AT MID-SURF ZONE	DYE	12M OFFSHORE	(DEPTH - 4.8m MSL)	
1	0100-Alongshore	19400	AT 14+20(433m)	I.D.#639	(SURFACE)	DIST. FROM	(SURFACE)	I.D.#679
1	Cross-shore							
1	Resultant							
1	0700-Alongshore	13	N	9	N	44	N	13 N
1	Cross-shore	23	Off	1	OF	131	20 Off	5 OF
1	Resultant	26	41	9	343	48	4	14 2
1	1300-Alongshore			13	N			8 N
1	Cross-shore			5	OF			2 OF
1	Resultant			14	1			8 358
1	1900-Alongshore			13	N			9 N
1	Cross-shore			4	OF			7 OF
1	Resultant			13	358			11 18
2	0100-Alongshore			13	N			8 N
2	Cross-shore			3	OF			4 OF
2	Resultant			13	353			9 8
2	0700-Alongshore	15	N	6	N	19	N	2 N
2	Cross-shore	11	On	0	0	132	0 0	1 OF
2	Resultant	12	225	6	340	19	340	1 359
2	1300-Alongshore			12	N			4 OF
2	Cross-shore			3	OF			6 19
2	Resultant			12	352			1 N
2	1900-Alongshore			9	N			2 OF
2	Cross-shore			1	OF			2 33
2	Resultant			9	344			1 S
3	0100-Alongshore			8	N			2 DF
3	Cross-shore			1	OF			3 88
3	Resultant			8	346			12 S
3	0700-Alongshore	47	S	1	S	4	N	4 ON
3	Cross-shore	10	0	6	ON	128	2 Off	13 178
3	Resultant	47	160	6	240	4	4	9 6
3	1300-Alongshore			3	S			0
3	Cross-shore			1	ON			9 160
3	Resultant			3	177			1
3	1900-Alongshore							1
3	Cross-shore							1
3	Resultant							1
4	0100-Alongshore							1
4	Cross-shore							1
4	Resultant							4 S
4	0700-Alongshore	2	S	2	N	14	N	1 1 DN
4	Cross-shore	1	Off	1	ON	128	4 Off	4 177
4	Resultant	2	138	2	303	14	357	7 S
4	1300-Alongshore			5	N			3 ON
4	Cross-shore			0				8 181
4	Resultant			5	340			0
4	1900-Alongshore			5	N			3 OF
4	Cross-shore			1	ON			3 70
4	Resultant			5	330			3 S
5	0100-Alongshore			3	N			0
5	Cross-shore			2	ON			3 160
5	Resultant			4	306			1 S
5	0700-Alongshore	5	N	7	N	34	N	0 OF
5	Cross-shore	0	0	0	0	130	0 0	3 70
5	Resultant	5	340	7	340	34	340	1 224
5	1300-Alongshore			6	N			1 ON
5	Cross-shore			0				1 2 OF
5	Resultant			6	340			6 1
5	1900-Alongshore			9	N			5 N
5	Cross-shore			0				2 OF
5	Resultant			9	340			6 1
6	0100-Alongshore			7	N			2 N
6	Cross-shore			0				2 OF
6	Resultant			7	340			2 29
6	0700-Alongshore	3	S	8	N	12	N	3 N
6	Cross-shore	10	Off	0	0	128	0 0	2 OF
6	Resultant	11	88	8	340	12	340	4 17
6	1300-Alongshore			2	S			1 1 OF
6	Cross-shore			4	ON			1 156
6	Resultant			5	220			6 S
6	1900-Alongshore			4	S			2 OF
6	Cross-shore			3	OF			6 137
6	Resultant			5	126			1

KEY = ALL SPEEDS IN CM/SEC
N = NORTHWARD, SHORE PARALLEL
S = SOUTHWARD, SHORE PARALLEL
DN = DOWN SHORE
OF = OFFSHORE

TABLE 4: CURRENT DATA
(SPEEDS IN CM/SEC)

DAY	TIME	PIER MEASUREMENTS			BEACH MEASUREMENTS (500 UPDRIFT)			CURRENT METER AT SOUTH TRIFOD (DEPTH -4.8m MSL)
		DYE AT 19+00 (579m)	CURRENT METER AT 14+20(433m) (SURFACE)	DYE AT MID-SURF ZC (SURFACE)	12M OFFSHORE DIST. FROM BASELINE(M)	LOCATION	SPEED DIR	
7	0100-Alongshore	8	N				1	N
	Cross-shore	0					4	OF
	Resultant	8	340				4	56
7	0700-Alongshore	0	0	5	N			
	Cross-shore	2	Off	0		152	0	OF
	Resultant	2	70	5	340	14	160	36
7	1300-Alongshore	1	N				7	5
	Cross-shore	1	DN				0	
	Resultant	1	304				7	160
7	1900-Alongshore	10	N				4	OF
	Cross-shore	6	OF				4	70
	Resultant	12	9				1	S
8	0100-Alongshore	6	N				2	OF
	Cross-shore	0					2	111
	Resultant	6	340				9	S
B	0700-Alongshore	12	N	3	N	44	N	
	Cross-shore	12	Off	3	ON	140	4	Off
	Resultant	17	25	4	284	55	346	11
B	1300-Alongshore	7	N				1	N
	Cross-shore	0					3	OF
	Resultant	7	340				3	45
B	1900-Alongshore	6	N				1	S
	Cross-shore	1	OF				4	OF
	Resultant	6	351				5	78
9	0100-Alongshore	6	N				3	S
	Cross-shore	4	OF				6	OF
	Resultant	8	14				7	96
9	0700-Alongshore	23	N	9	N	20	N	
	Cross-shore	6	Off	2	OF	135	12	Off
	Resultant	23	354	10	354	23	11	
9	1300-Alongshore	6	N				0	
	Cross-shore	1	OF				1	OF
	Resultant	6	349				2	70
9	1900-Alongshore	11	N				6	OF
	Cross-shore	2	OF				6	50
	Resultant	11	352				6	N
10	0100-Alongshore	13	N				4	OF
	Cross-shore	2	OF				7	15
	Resultant	13	348				2	
10	0700-Alongshore	9	N	7	N	12	N	
	Cross-shore	9	Off	0		152	4	Off
	Resultant	12	25	7	340	12	357	38
10	1300-Alongshore	4	N				4	S
	Cross-shore	6	DF				5	OF
	Resultant	7	34				7	108
10	1900-Alongshore	11	N				2	OF
	Cross-shore	1	OF				5	4
	Resultant	11	345				5	N
11	0100-Alongshore	6	N				2	DF
	Cross-shore	1	ON				5	7
	Resultant	6	330				0	
11	0700-Alongshore	0	0	7	N	12	N	
	Cross-shore	0	0	2	OF	140	5	Off
	Resultant	0	7	357		13	4	70
11	1300-Alongshore	6	N				1	N
	Cross-shore	0					2	OF
	Resultant	6	340				2	43
11	1900-Alongshore	8	N				0	
	Cross-shore	0					2	OF
	Resultant	8	340				2	70
12	0100-Alongshore	7	N				1	N
	Cross-shore	0					2	OF
	Resultant	7	340				2	48
12	0700-Alongshore	16	N	13	N	41	N	
	Cross-shore	16	Off	2	OF	140	0	South
	Resultant	23	25	13	342	44	340	358
12	1300-Alongshore	8	N				6	N
	Cross-shore	1	OF				2	OF
	Resultant	8	344				6	359
12	1900-Alongshore	7	N				1	N
	Cross-shore	0					2	OF
	Resultant	7	340				3	44

KEY = ALL SPEEDS IN CM/SEC
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S = SOUTHWARD, SHORE PARALLEL
DN=ONSHORE
OF=OFFSHORE

TABLE 4: CURRENT DATA
(SPEEDS IN CM/SEC)

DAY	TIME	PIER MEASUREMENTS			(500 UPDRIFT)			BEACH MEASUREMENTS			CURRENT METER AT SOUTH TRIPOD (DEPTH -4.8m MSL)	
		DYE AT	CURRENT METER		DYE	AT 14+20(433m)	DYE AT MID-SURF ZONE	12M OFFSHORE	(SURFACE)	(SURFACE)	LOCATION	ISPEED DIR BASELINE(M) ISPEED DIR ISPEED DIR
13	0100-Alongshore											1 N
	Cross-shore		0									2 OF
	Resultant		7	340								2 S
13	0700-Alongshore	18	5	2	N		28	S				0
	Cross-shore	3	Off	4	ON	146	14	Off	North			1 160
	Resultant	18	151	4	279		31	133				6 5
13	1300-Alongshore			8	N							0
	Cross-shore			2	ON							6 160
	Resultant			6	312							1 S
13	1900-Alongshore			5	N							2 OF
	Cross-shore			1	OF							3 96
	Resultant			5	352							4 N
14	0100-Alongshore			7	N							4 OF
	Cross-shore			1	OF							6 28
	Resultant			7	344							1
14	0700-Alongshore	10	0	7	N		16	S				3 OF
	Cross-shore	0	0	1	OF	152	0	0	North			3 20
	Resultant	10		7	349		16	160				4 5
14	1300-Alongshore			1	N							3 OF
	Cross-shore			2	OF							5 124
	Resultant			2	29							0
14	1900-Alongshore			7	N							1 OF
	Cross-shore			0	OF							1 70
	Resultant			7	340							5 N
15	0100-Alongshore			13	N							3 OF
	Cross-shore			2	OF							6 11
	Resultant			13	350							0
15	0700-Alongshore	0	0	6	N		14	N				1 OF
	Cross-shore	0	0	1	OF	140	0	0	South			1 70
	Resultant	0		6	351		14	340				0
15	1300-Alongshore			11	N							4 OF
	Cross-shore			2	OF							4 70
	Resultant			11	351							1 S
15	1900-Alongshore			6	N							1 OF
	Cross-shore			0	OF							1 107
	Resultant			6	340							2 N
16	0100-Alongshore			12	N							3 37
	Cross-shore			3	OF							1
	Resultant			13	352							1
16	0700-Alongshore	0	0	6	N							1 OF
	Cross-shore	8	Off	0	OF	134	23	N				1 44
	Resultant	31	20	6	340		24	2				2 N
16	1300-Alongshore			10	N							3 OF
	Cross-shore			1	OF							4 31
	Resultant			10	345							1 N
16	1900-Alongshore			7	N							2 OF
	Cross-shore			1	OF							3 39
	Resultant			7	346							0
17	0100-Alongshore			7	N							2 OF
	Cross-shore			0	OF							2 70
	Resultant			7	340							0
17	0700-Alongshore	10	S	7	N		20	N				3 OF
	Cross-shore	5	Off	1	OF	128	0	0	South			3 70
	Resultant	11	131	7	344		20	340				0
17	1300-Alongshore			8	N							2 DF
	Cross-shore			1	OF							2 70
	Resultant			8	349							0
17	1900-Alongshore			7	N							2 DF
	Cross-shore			1	OF							2 70
	Resultant			7	346							1 N
18	0100-Alongshore			9	N							1 3 OF
	Cross-shore			1	OF							3 55
	Resultant			9	347							0
18	0700-Alongshore	13	N	6	N							1 1 OF
	Cross-shore	22	Off	0	OF	128	22	N				1 70
	Resultant	126	40	6	340		22	340				0
18	1300-Alongshore			7	N							2 OF
	Cross-shore			0	OF							2 70
	Resultant			2	340							0
18	1900-Alongshore			9	N							4 OF
	Cross-shore			2	OF							4 70
	Resultant			9	350							0

KEY = ALL SPEEDS IN CM/SEC
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ON=ONSHORE
OF=OFFSHORE

TABLE A: CURRENT DATA
(SPEEDS IN CM/SEC)

PIER MEASUREMENTS				BEACH MEASUREMENTS (500 UPDRIFT)			
	DYE AT 19400 (579m)	CURRENT METER AT 14120 (433m) I.D. #639	DYE AT MID-SURF ZONE (SURFACE)	DYE AT 12M OFFSHORE (DEPTH -4.8m MSL)	AT SOUTH TRIPOD (DEPTH -4.8m MSL)	CURRENT METER 12M OFFSHORE (SURFACE)	
MAY 19	TIME	SPEED	DIR	BASELINE (m)	SPEED	DIR	LOCATION
19 0100	Alongshore	10	N			1	N
	Cross-shore	1	OF			3	OF
	Resultant	10	348			3	46
19 0700	Alongshore	9	N	8	N	1	S
	Cross-shore	0	OF	138	2 OFF	2	OF
	Resultant	9	340	6	347	3	91
19 1300	Alongshore	5	N			2	S
	Cross-shore	1	DN			1	OF
	Resultant	5	327			5	N
19 1900	Alongshore	17	N			4	OF
	Cross-shore	4	OF			6	21
	Resultant	17	352			0	
20 0100	Alongshore	7	N			2	OF
	Cross-shore	1	OF			2	70
	Resultant	7	345			1	S
20 0700	Alongshore	24	S	7	S	1	OF
	Cross-shore	6	Off	1	ON	2	109
	Resultant	25	146	5	324	6	S
20 1300	Alongshore	0	ON			2	DF
	Cross-shore	4	250			1	N
	Resultant	7	N			2	OF
20 1900	Alongshore	1	OF			2	36
	Cross-shore	7	344			0	
	Resultant	6	N			2	OF
21 0100	Alongshore	1	OF			2	70
	Cross-shore	7	342			6	S
	Resultant	7	N	0	0	1	OF
21 0700	Alongshore	19	S	128	0	6	155
	Cross-shore	19	On	0	0	13	S
	Resultant	27	205	2	349	3	ON
21 1300	Alongshore	0	S			14	173
	Cross-shore	0	ON			7	S
	Resultant	1	160			2	ON
21 1900	Alongshore	0	ON			7	180
	Cross-shore	1	250			7	S
	Resultant	1	N			1	ON
22 0100	Alongshore	4	N			7	166
	Cross-shore	3	ON			3	S
	Resultant	5	308			1	DN
22 0700	Alongshore	15	S	140	0	4	174
	Cross-shore	0	0	0	0	2	S
	Resultant	15	160	5	297	2	DF
22 1300	Alongshore	2	OF			3	117
	Cross-shore	6	6			1	N
	Resultant	1	7	N		2	OF
22 1900	Alongshore	0	ON			2	31
	Cross-shore	7	340			0	
	Resultant	6	N			2	OF
23 0100	Alongshore	1	OF			2	20
	Cross-shore	1	OF			1	N
	Resultant	6	347			1	OF
23 0700	Alongshore	21	N	128	29 N	0	30
	Cross-shore	0	0	1	0	2	
	Resultant	21	340	7	342	29	340
23 1300	Alongshore	6	N			0	
	Cross-shore	0	ON			1	
	Resultant	6	340			9	N
23 1900	Alongshore	16	N			2	DF
	Cross-shore	3	OF			9	350
	Resultant	16	350			2	N
24 0100	Alongshore	7	N			2	DF
	Cross-shore	1	OF			3	30
	Resultant	7	345			2	N
24 0700	Alongshore	12	N	140	18 N	1	2
	Cross-shore	0	0	1	0	4	DF
	Resultant	12	340	7	346	4	40
24 1300	Alongshore	6	N			0	
	Cross-shore	0	ON			1	
	Resultant	6	340			4	N
24 1900	Alongshore	12	N			3	OF
	Cross-shore	3	OF			5	14
	Resultant	12	340				

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 ON = ON SHORE
 OF = OFFSHORE

TABLE 4: CURRENT DATA
(SPEEDS IN CM/SEC)

DAY	TIME	PIER MEASUREMENTS			BEACH MEASUREMENTS (500' UPDRIFT)			CURRENT METER		
		DYE AT 19400 (579m) (SURFACE)	CURRENT METER AT 14120(433m) I.D.#639 (DEPTH -4.2m MSL)	DYE AT MID-SURF ZONE (SURFACE)	DIST. FROM 12M OFFSHORE (SURFACE)	DYE 12M OFFSHORE (DEPTH -4.8m MSL)	I.D.#679			
		SPEED DIR	SPEED DIR	DIR	BASELINE(m)	SPEED DIR	LOCATION	SPEED DIR	SPEED DIR	
25	0100-Alongshore	9 N						8 N		
	Cross-shore	1 OF						4 OF		
	Resultant	9 347						9 Z		
25	0700-Alongshore	16 S	5 N		23 S		39 S	1 1 OF		
	Cross-shore	0 0	0	141	0 D	North		1 1 Z		
	Resultant	16 160	5 340		23 160			15 S		
25	1300-Alongshore	2 S						5 ON		
	Cross-shore	3 ON						16 180		
	Resultant	4 212						6 N		
25	1900-Alongshore	13 N						15 OF		
	Cross-shore	5 OF						16 47		
	Resultant	14 1						11 N		
26	0100-Alongshore	13 N						4 OF		
	Cross-shore	2 OF						12 2		
	Resultant	13 347						7 N		
26	0700-Alongshore	9 S	7 N		76 S		10 S	5 OF		
	Cross-shore	0 0	1 OF	149	8 Off	North		9 12		
	Resultant	9 160	7 345		77 154			14 S		
26	1300-Alongshore	1 S						7 ON		
	Cross-shore	5 ON						15 186		
	Resultant	5 241						16 S		
26	1900-Alongshore	1 S						5 ON		
	Cross-shore	3 ON						17 178		
	Resultant	3 228						24 S		
27	0100-Alongshore	7 S						8 ON		
	Cross-shore	6 ON						25 179		
	Resultant	9 199						S		
27	0700-Alongshore	136 S	5 S		152 S		16 S	10 ON		
	Cross-shore	0 0	4 ON	164	0 0	North		23 185		
	Resultant	136 160	6 196		152 160			19 S		
27	1300-Alongshore	6 S						8 ON		
	Cross-shore	6 ON						21 183		
	Resultant	9 203						S		
27	1900-Alongshore	0						8 ON		
	Cross-shore	1 ON						18 185		
	Resultant	1 250						S		
28	0100-Alongshore	2 N						6 ON		
	Cross-shore	2 ON						14 186		
	Resultant	3 295						S		
28	0700-Alongshore	47 S	1 S		122 S		12 S	19 S		
	Cross-shore	0 0	5 ON	140	0 0	North		9 ON		
	Resultant	47 160	5 235		122 160			21 185		
28	1300-Alongshore	3 N						12 ON		
	Cross-shore	2 OF						12 171		
	Resultant	4 13						S		
28	1900-Alongshore	4 N						0		
	Cross-shore	1 ON						8 160		
	Resultant	4 325						N		
29	0100-Alongshore	7 N						8 ON		
	Cross-shore	0						4 OF		
	Resultant	7 340						9		
29	0700-Alongshore	6 N	7 N		61 S		10 S	3 OF		
	Cross-shore	7 Off	1 OF	140	31 Off	South		5 16		
	Resultant	10 30	7 344		68 132			S		
29	1300-Alongshore	10 N						5 OF		
	Cross-shore	2 OF						9 19		
	Resultant	10 352						N		
29	1900-Alongshore	14 N						6 OF		
	Cross-shore	4 OF						6 OF		
	Resultant	15 354						9 24		
30	0100-Alongshore	15 N						8 N		
	Cross-shore	6 OF						7 OF		
	Resultant	16 3						11 22		
30	0700-Alongshore	15 N	6 N		44 N		43 N	2 S		
	Cross-shore	9 On	1 OF	140	11 Off	South		6 OF		
	Resultant	17 309	6 350		45 354			6 86		
30	1300-Alongshore	8 N						6 OF		
	Cross-shore	1 OF						7 34		
	Resultant	8 346						N		
30	1900-Alongshore	8 N						7 OF		
	Cross-shore	1 OF						7 33		
	Resultant	9 350						S		

KEY = ALL SPEEDS IN CM/SEC
 N=NORTHWARD, SHORE PARALLEL
 S=SOUTHWARD, SHORE PARALLEL
 ON=UNSHORE
 OF=OFFSHORE

V. SUPPLEMENTAL OBSERVATIONS

Visual wave direction measurements (Table 5) taken at the seaward end of the pier are made of both the primary wave train (i.e. that having the larger wave heights) and the secondary wave train (which must be clearly distinguishable as a wave train separate from the primary waves) but not surface chop or capillary waves. The direction of the primary wave train just north of the seaward end of the pier is also determined using a Raytheon Marine Pathfinder radar and measuring alignment of the wave crests. The pier axis (considered perpendicular to the beach at the FRF) is orientated 70° east of true north; consequently, wave angles greater than 70° imply the waves were coming from the south side of the pier.

The width of the surf zone (seawardmost breaker position to shoreline) is determined from the pier deck.

Measurements of surface water temperature, density, and visibility are made daily at the seaward end of the FRF pier. A jar along with a thermometer is lowered about .3 m (1 ft) into the water and allowed to remain for at least one minute. The jar is removed, the temperature read and a hydrometer is used to determine the density. A secci disc is used to determine the surface visibility.

SUPPLEMENTAL OBSERVATIONS

June 1985

DAY / TIME	WAVE APPROACH ANGLE AT PIER END (° from True N)		RADAR WAVE ANGLE (° from True N)	WIDTH OF SURF ZONE (M)	WATER CHARACTERISTICS AT PIER END		
	PRIMARY	SECONDARY			TEMP (°C)	DENSITY (g/cc)	SECCI VIS (M)
1 0635	85	150		46	18.7	1.0245	1.2
2 0800	110			30	20.1	1.0236	2.7
3 0715	95			21	21.9	1.0206	2.4
4 0730	95			24	22.2	1.0202	2.4
5 0700	110			22	19.9	1.0230	2.4
6 0700	115			18	17.2	1.0248	2.4
7 0700	50	100		46	18.5	1.0242	2.7
8 0625	80	120		33	20.4	1.0230	2.4
9 0830	45	75		44	20.7	1.0233	5.8
10 0700				36	19.5	1.0223	4.9
11 0700	80			30	20.6		5.8
12 0630	145			33	17.9		3.6
13 0700	10		30	33	16.9		4.6
14 0700	40			58	20.3	1.0234	6.4
15 0830				24	21.0	1.0228	7.6
16 0800	90			24	17.0	1.0256	4.0
17 0800	120			21	16.5	1.0246	5.8
18 0700	130			24	17.4	1.0247	4.0
19 0700	100			12	18.0	1.0247	5.5
20 0715	125	95		5	17.2	1.0248	4.9
21 0700	85			10	18.4	1.0247	7.3
22 0630	80			27	22.5	1.0212	5.2
23 0930	95			14	21.2	1.0230	5.8
24 0700	120	100		20	18.4	1.0242	4.3
25 0715	40			24	16.2	1.0251	4.9
26 0700	60		60	55	19.2	1.0248	2.4
27 0700	50		60	207	19.5	1.0230	1.2
28 0700	55		60	114	20.3	1.0220	1.2
29 0800	60		60	76	21.9	1.0230	2.1
30 0730	90		90	64	21.3	1.0232	3.0

VI. WATER LEVELS

The National Ocean Services (NOS) has established a primary tide station (No. 865-1370) at the seaward end of the FRF pier. A Leupold-Stevens digital recording float-type tide gage is used to collect data every 6 minutes throughout the month.

Figure 4 shows the range of each cycle while Figure 5 shows the variation in mean water levels computed over a tidal cycle period (12.42 hours), and contains a list of selected mean and extreme values. This presentation is useful in identifying effects on both meteorological and astronomical forces on the open coast water levels.

Table 6 contains the time of the center of each sampling interval and the range, high, low, and mean water levels during each tidal cycle.

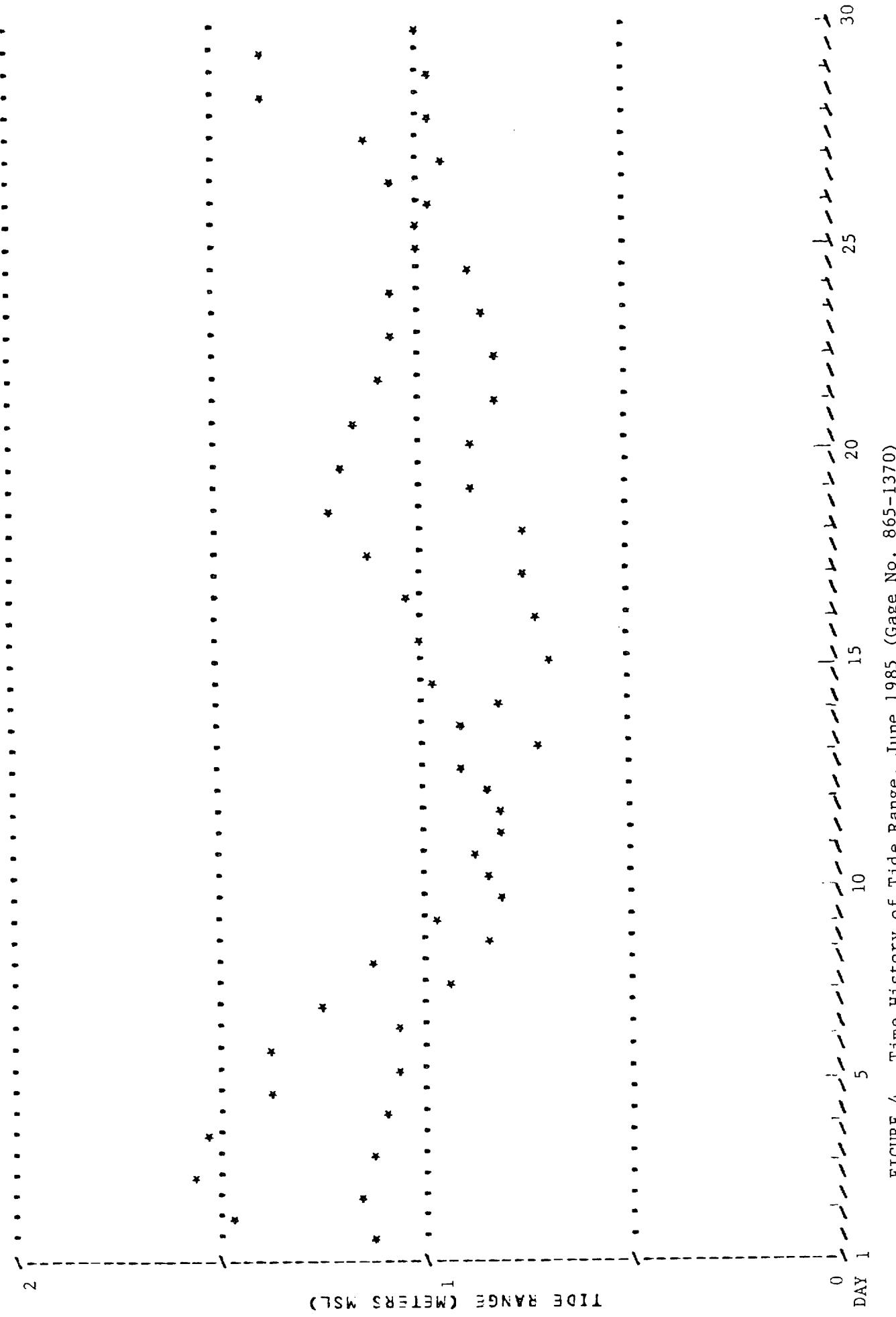


FIGURE 4. Time History of Tide Range, June 1985 (Gage No. 865-1370)

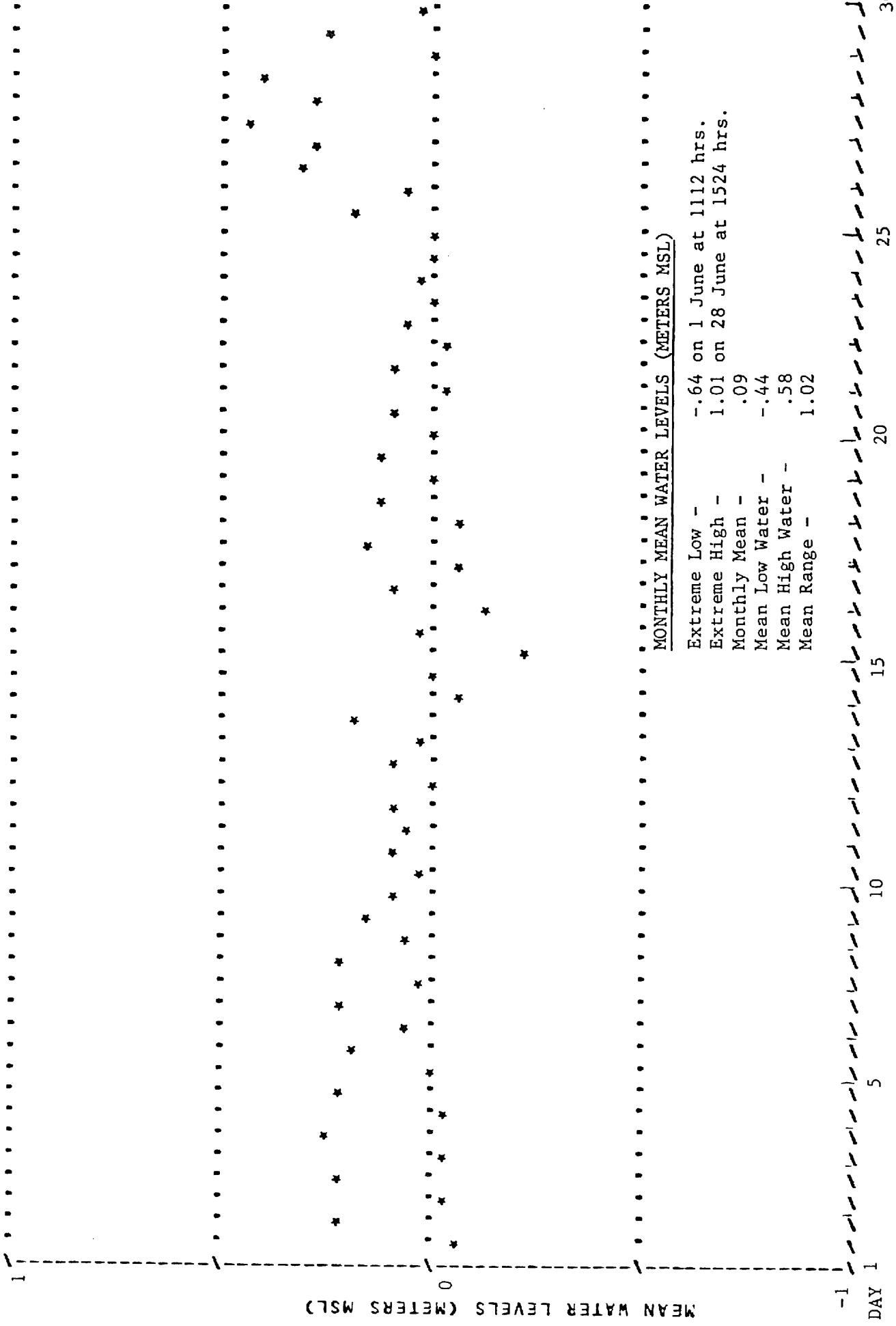


FIGURE 5. Time History of Mean Water Levels, June 1985 (Gage No. 865-1370)

MID-CYCLE DAY	TIME	LOW	HIGH	MEAN	RANGE
1	612	-.64	.49	-.07	1.12
1	1837	-.56	.93	-.20	1.48
2	702	-.59	.57	-.02	1.16
2	1928	-.61	.95	.22	1.56
3	753	-.57	.57	-.02	1.14
3	2018	-.56	.98	.24	1.54
4	843	-.55	.55	-.02	1.11
4	2108	-.49	.89	.23	1.38
5	934	-.52	.54	-.01	1.06
5	2159	-.55	.84	.18	1.38
6	1024	-.49	.59	.06	1.07
6	2249	-.45	.80	.22	1.26
7	1114	-.45	.48	.04	.93
7	2340	-.39	.73	.21	1.12
8	1205	-.37	.47	.06	.84
9	30	-.36	.61	.16	.97
9	1255	-.35	.46	.09	.81
10	120	-.41	.44	.05	.85
10	1346	-.40	.48	.09	.87
11	211	-.38	.43	.07	.81
11	1436	-.30	.51	.10	.80
12	301	-.45	.40	.01	.84
12	1526	-.40	.51	.09	.91
13	352	-.32	.39	.02	.71
13	1617	-.27	.63	.20	.91
14	442	-.50	.31	-.06	.80
14	1707	-.53	.43	-.00	.96
15	532	-.54	.15	-.21	.69
15	1758	-.48	.52	.03	.99
16	623	-.47	.24	-.13	.71
16	1848	-.43	.60	.10	1.03
17	713	-.42	.33	-.06	.76
17	1938	-.43	.69	.15	1.12
18	804	-.43	.32	-.07	.76
18	2029	-.51	.73	.14	1.23
19	854	-.41	.47	-.01	.88
19	2119	-.48	.69	.14	1.18
20	944	-.44	.44	-.01	.87
20	2210	-.51	.65	.11	1.15
21	1035	-.40	.41	-.02	.81
21	2300	-.49	.62	.09	1.10
22	1125	-.44	.39	-.04	.82
22	2350	-.48	.59	.07	1.06
23	1216	-.41	.43	-.01	.84
24	41	-.53	.53	.02	1.05
24	1306	-.42	.44	-.00	.86
25	131	-.52	.48	-.00	1.00
25	1356	-.30	.69	.19	.99
26	222	-.46	.51	.06	.97
26	1447	-.26	.81	.32	1.07
27	312	-.18	.76	.29	.94
27	1537	-.15	.98	.43	1.12
28	402	-.21	.76	.28	.98
28	1628	-.36	1.01	.40	1.38
29	453	-.50	.46	-.00	.96
29	1718	-.46	.91	.25	1.37
30	543	-.46	.52	.02	.98

TABLE 6
WATER LEVELS (METERS MSL)
Tidal Characteristics
June 1985

VII. NEARSHORE PROFILES

A. Nearshore Profiles. In order to document profile response away from the pier, surveys of four profile lines extending 900 to 1,000 m from shore and located 489 and 581 m north and 517 and 608 m south of the FRF pier are conducted bi-weekly, after storms, and during more complete bathymetric surveys.

These profiles are obtained using the CRAB-Zeiss surveying system; a Zeiss Elta-2 first-order, self-recording electronic theodolite distance meter in combination with the Coastal Research Amphibious Buggy (CRAB), a 10.7 m high, self-powered, mobile tripod on wheels.

Figure 6 shows the last survey in May and the only survey taken during June on profile line 188, located 517 m south of the pier. The only significant change is complete removal of the nearshore bar (100 to 160 m).

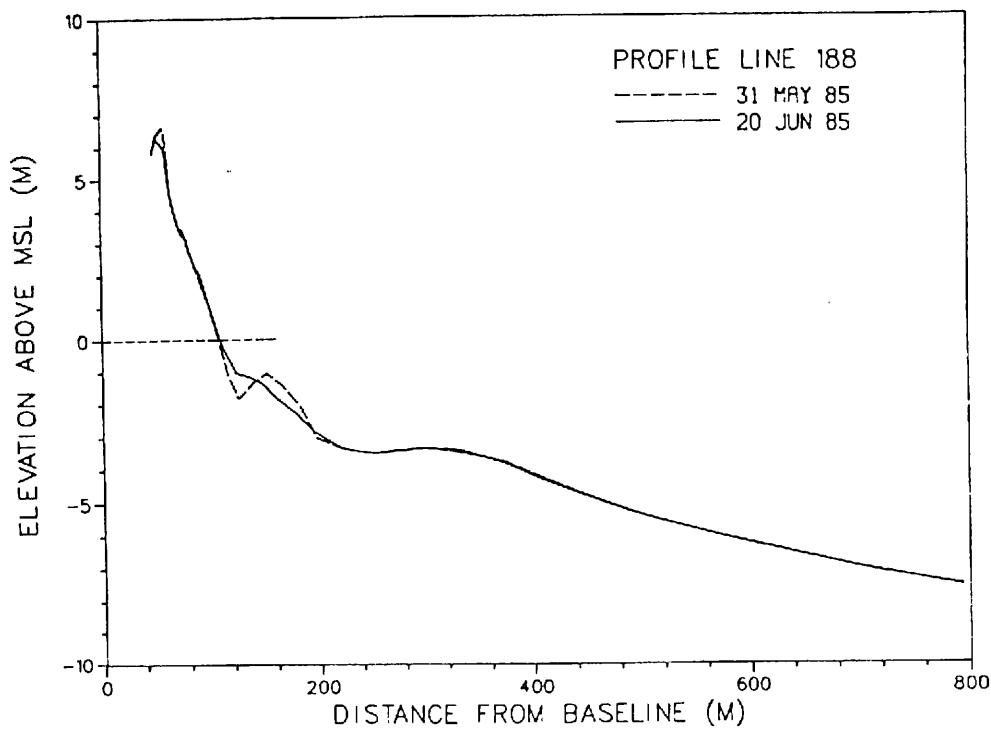


Figure 6. Monthly CRAB profiles on profile 188 -
517 meters south of pier.

The profile envelope (Figure 7) reflects the maximum changes which occurred on the profile between January and June. No changes occurred to the envelope during June.

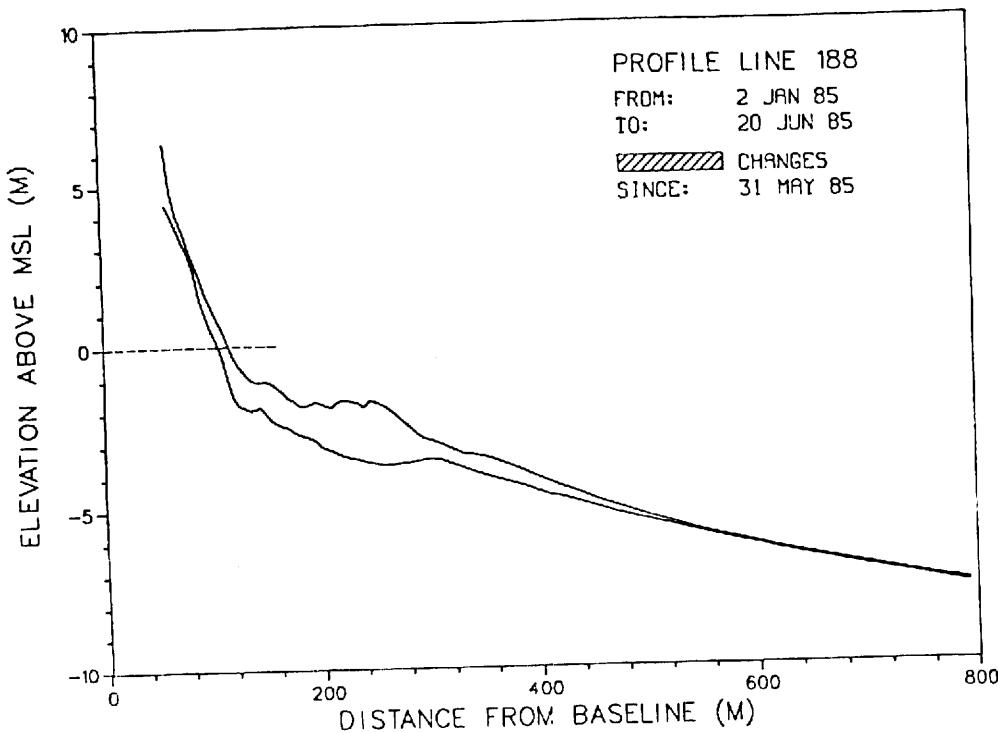


Figure 7. CRAB profile envelope - profile 188.

B. Bathymetry. There was no bathymetric survey conducted during May; however, the April survey is included for reference.

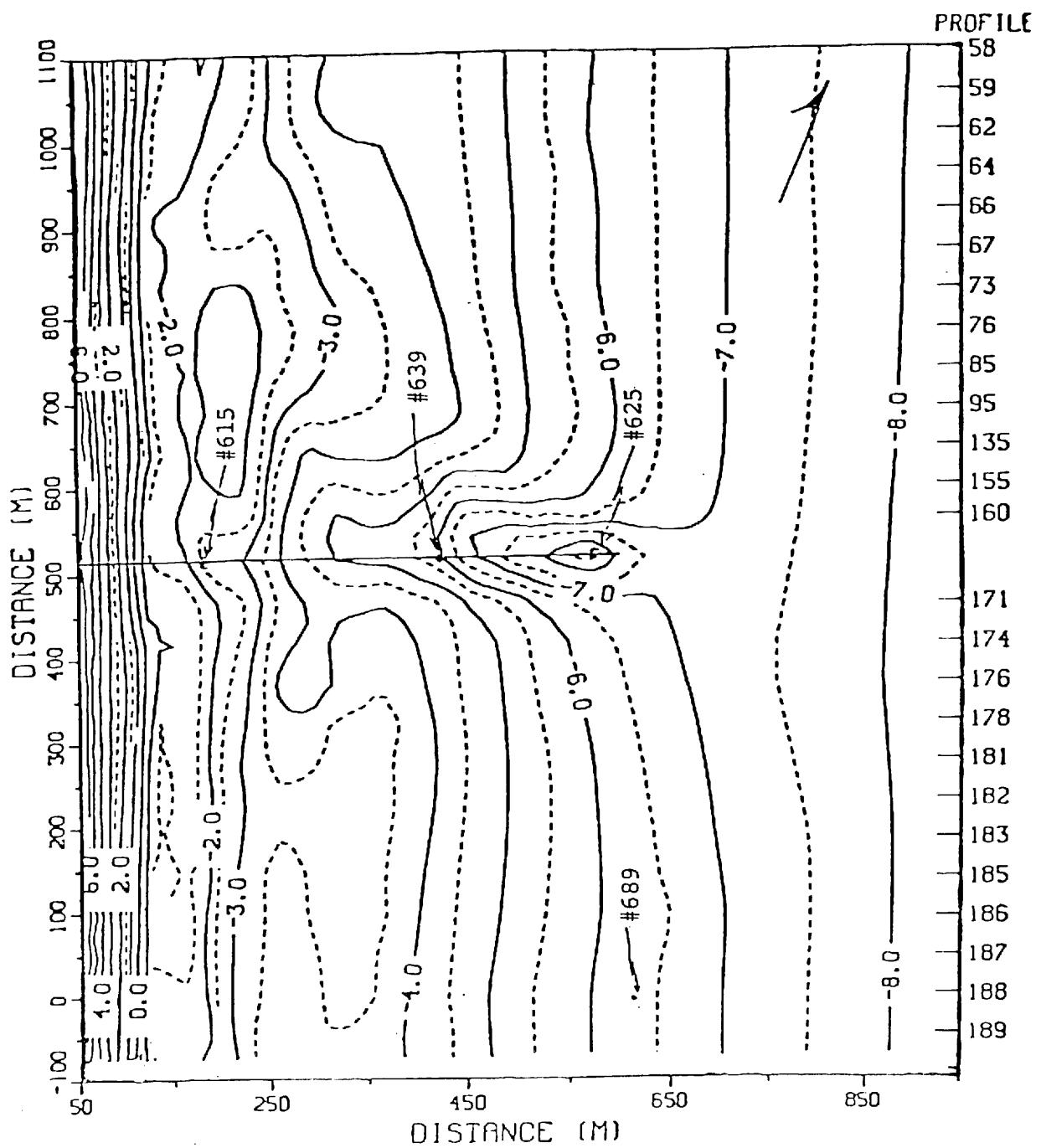


FIGURE 8. FRF BATHYMETRY 23 APR 85
CONTOURS IN METERS

Distribution List

Government Agencies:

OCE	U.S. Geological Survey
BERH	U.S. National Park Service
NAO	U.S. Naval Academy
NASA/Wallops Flight Center	U.S. Naval Civil Eng. Lab
NOAA (NOS, NWS)	U.S. Naval Facilities Eng. Com.
SAD	U.S. Naval Research Lab
SAW	

Colleges/Universities:

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Louisiana State University	University of Florida
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Old Dominion University	University of North Carolina
Oregon State University	University of Northern Colorado
Prince George's College	University of Rhode Island
Rutgers University	University of Virginia
Scripps Inst. of Oceanography	Virginia Inst. of Marine Science

Others:

City of Va. Beach, VA	Moffatt & Nichol, Eng.
Coastal Barge Corporation	Offshore Coastal Technologies
Coastal and Est. Res., Inc.	Research Planning Institute, Inc.
Dr. Galvin	Mr. Rowland
GEOMET, Inc.	Mr. Savage
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W. F. Baird & Asso. Coastal Engineers, Ltd (Canada)
Ministry of Construction, Coastal Division (Japan)
Norwegian Hydrodynamic Laboratories (Norway)
University of New South Wales (Australia)
University of Sydney (Australia)